All India Test Series (2023-24)

Test Code: ANY/08 | **AITS TEST - 08** | **YAKEEN NEET**

DURATION: 200 Minutes | **DATE: 17/04/2024** | **M. MARKS: 720**

ANSWER KEY

(PHYSICS)

SECTION-A

1.	(2)	8.	(3)	15.	(4)	22.	(3)	29.	(2)
2.	(3)	9.	(2)	16.	(1)	23.	(4)	30.	(2)
3.	(1)	10.	(4)	17.	(3)	24.	(4)	31.	(1)
4.	(4)	11.	(2)	18.	(1)	25.	(3)	32.	(4)
5.	(2)	12.	(1)	19.	(1)	26.	(1)	33.	(1)
6.	(1)	13.	(4)	20.	(2)	27.	(3)	34.	(1)
7.	(1)	14.	(2)	21.	(2)	28.	(4)	35.	(2)

SECTION-B

36.	(1)	39.	(4)	42.	(2)	45.	(1)	48.	(1)
37.	(3)	40.	(1)	43.	(2)	46.	(2)	49.	(1)
38.	(1)	41.	(3)	44.	(3)	47.	(3)	50.	(4)

(CHEMISTRY)

SECTION-A

51.	(1)	58.	(4)	65.	(2)	72.	(2)	79.	(2)
52.	(4)	59.	(3)	66.	(4)	73.	(3)	80.	(2)
53.	(1)	60.	(3)	67.	(3)	74.	(1)	81.	(3)
54.	(3)	61.	(1)	68.	(2)	75.	(3)	82.	(4)
55.	(1)	62.	(3)	69.	(3)	76.	(3)	83.	(4)
56.	(2)	63.	(4)	70.	(2)	77.	(2)	84.	(1)
57.	(3)	64.	(2)	71.	(4)	78.	(1)	85.	(3)

SECTION-B

86.	(1)	89.	(3)	92.	(1)	95.	(4)	98.	(4)
87.	(2)	90.	(3)	93.	(2)	96.	(2)	99.	(1)
88.	(3)	91.	(4)	94.	(2)	97.	(3)	100.	(1)

(BOTANY)

SECTION-A

101.	(2)	108.	(4)	115.	(2)	122.	(4)	129.	(1)
102.	(1)	109.	(3)	116.	(2)	123.	(2)	130.	(2)
103.	(2)	110.	(4)	117.	(1)	124.	(1)	131.	(4)
104.	(3)	111.	(2)	118.	(3)	125.	(4)	132.	(2)
105.	(4)	112.	(2)	119.	(3)	126.	(1)	133.	(3)
106.	(3)	113.	(2)	120.	(3)	127.	(4)	134.	(1)
107.	(3)	114.	(3)	121.	(2)	128.	(4)	135.	(2)

SECTION-B

136.	(1)	139.	(4)	142.	(3)	145.	(2)	148.	(4)
137.	(2)	140.	(1)	143.	(3)	146.	(3)	149.	(3)
138.	(1)	141.	(3)	144.	(2)	147.	(3)	150.	(1)

(ZOOLOGY)

SECTION-A

151.	(2)	158.	(4)	165.	(4)	172.	(3)	179.	(4)
152.	(3)	159.	(2)	166.	(1)	173.	(4)	180.	(2)
153.	(2)	160.	(2)	167.	(2)	174.	(2)	181.	(2)
154.	(4)	161.	(3)	168.	(1)	175.	(3)	182.	(1)
155.	(1)	162.	(4)	169.	(1)	176.	(3)	183.	(1)
156.	(3)	163.	(2)	170.	(3)	177.	(2)	184.	(3)
157.	(3)	164.	(1)	171.	(4)	178.	(1)	185.	(1)

SECTION-B

186.	(4)	189.	(3)	192.	(3)	195.	(3)	198.	(3)
187.	(2)	190.	(4)	193.	(3)	196.	(1)	199.	(4)
188.	(4)	191.	(4)	194.	(4)	197.	(4)	200.	(2)

Hints & Solutions

[AITS-08 | Yakeen-NEET | 17-04-2024]

(PHYSICS)

SECTION-A

1. (2)

Average acceleration is along the direction of change in velocity.

$\Delta\vec{V} = \vec{V}_f - \vec{V}_i$

$\vec{V}_f$ is along west and $-\vec{V}_i$ is along south so their resultant with be along southwest.

(NEW NCERT 11th Page No. 34)

2. (3)

Areal velocity is constant

$\therefore$ Time to cover large area would be greater

Area along the path *DAB* < Area along path *BCD*

$\Rightarrow$ time along *DAB* < time along *BCD*

$\therefore T_1 < T_2$

(NEW NCERT 11th Page No. 128)

3. (1)

Potential drop across resistance is 4.5 V

$I = \frac{4.5}{100}\text{A} = 45\,\text{mA}$

(NEW NCERT 12th Page No. 333)

4. (4)

After solidification the radius is *R*.

Equating the volume $(27)\frac{4}{3}\pi r^3 = \frac{4}{3}\pi R^3$

$3r = R$

$C = 4\pi\varepsilon_0 r$

Capacitance is proportional to radius

$\therefore$ capacitance becomes three times.

(NEW NCERT 12th Page No. 67)

5. (2)

$\frac{T_{\text{upward}}}{T_{\text{downwards}}} = \frac{m(g+a)}{m(g-a)} = \frac{12}{8} = \frac{3}{2}$

(NEW NCERT 11th Page No. 59)

6. (1)

Time period is independent of mass of the bob.

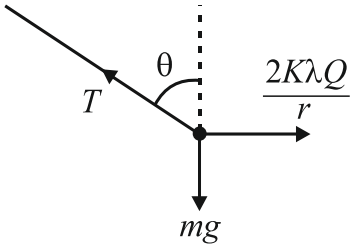
$T \propto \sqrt{L}$

If length is made four times, the time period will be doubled.

(NEW NCERT 11th Page No. 270)

7. (1)

For equilibrium



$T\sin\theta = \frac{2K\lambda Q}{r}$ …(1)

$T\cos\theta = mg$ …(2)

From (1) and (2)

$\tan\theta = \frac{2K\lambda Q}{mgr}$

(NEW NCERT 12th Page No. 33)

8. (3)

$H' = e^2 H$

$\frac{3H}{4} = e^2 H$

$\Rightarrow e = \frac{\sqrt{3}}{2}$

(NEW NCERT 11th Page No. 83)

9. (2)

At resonance in series LCR circuit, the power factor $\cos\phi = \frac{R}{Z} = 1$; as the circuit becomes purely resistive.

(NEW NCERT 12th Page No. 190)

10. (4)

$[h] = [mvr] = [ML^2T^{-1}]$

(NEW NCERT 12th Page No. 276)

11. (2)

$F = T(2\ell)$

$= (0.072)(2\times5\times10^{-2})$

$= 7.2\times10^{-3}\,\text{N}$

(NEW NCERT 11th Page No. 193)

12. (1)

All resistances are in parallel

$$\frac{1}{R_{eq}}=\frac{1}{R}+\frac{1}{2R}+\frac{1}{3R}$$

$$\frac{1}{R_{eq}}=\frac{6+3+2}{6R}=\frac{11}{6R}$$

$$\Rightarrow R_{eq}=\frac{6R}{11}$$

(NEW NCERT 12th Page No. 59)

13. (4)

Area = $\left|\vec{A}\times\vec{B}\right|$

$=\left|(2\hat{i}+3\hat{j})\times(\hat{i}+4\hat{j})\right|$

$=\left|8(\hat{k})-3\hat{k}\right|=\left|5\hat{k}\right|$ unit

(NEW NCERT 11th Page No. 101)

14. (2)

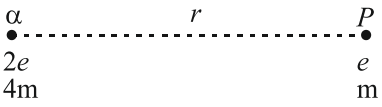
$$P=\frac{\text{Work}}{\frac{\text{time}}{\text{efficiency}}}$$

$$=\frac{100\times10\times10}{5\times0.6}$$

P = 3.33 kW

(NEW NCERT 11th Page No. 83)

15. (4)



Conservation of Mechanical Energy

$$\frac{K(2e^2)}{r}=K_\alpha+K_P \quad \ldots(1)$$

From conservation of linear momentum

$P_\alpha=P_P$

$\sqrt{2m_\alpha K_\alpha}=\sqrt{2m_P K_P}$

$$\Rightarrow K_P=\frac{m_\alpha}{m_P}K_\alpha=4K_\alpha$$

From (1)

$$\frac{2Ke^2}{r}=5K_\alpha$$

$$\Rightarrow K_\alpha=\frac{2}{5}\frac{Ke^2}{r}$$

(NEW NCERT 12th Page No. 55)

16. (1)

$\because\ \omega_2=\omega_1+\alpha t$

$\therefore\ 40\pi = 20\pi + 10\alpha$

$\Rightarrow \alpha = 2\pi$ rad/s^2

Angular displacement

$$\theta=\frac{\omega_2^2-\omega_1^2}{2\alpha}=\frac{(40\pi)^2-(20\pi)^2}{2\times2\pi}=\frac{1200\pi^2}{4\pi}$$

$=300\pi$ rad

Therefore, the number of rotations undergone

$$=\frac{\theta}{2\pi}=\frac{300\pi}{2\pi}=150$$

(NEW NCERT 11th Page No. 103)

17. (3)

For adiabatic process $TV^{\gamma-1}=C$

$$300\,V^{\gamma-1}=T_f\left(\frac{V}{4}\right)^{\gamma-1}$$

$$\Rightarrow T_f=300\times4^{\frac{1}{2}}=600K$$

$\Delta Q=0 \quad \Delta U=-\Delta W$

$$\Delta U=\frac{nR\Delta T}{\gamma-1}=\frac{1\times8.314\times300}{\frac{1}{2}}$$

= 600 × 8.314 = 4988.5 J

(NEW NCERT 11th Page No. 233)

18. (1)

At t = 0, I = 2A and $\frac{dI}{dt}=1$ A/s

$$V_A-IR-L\frac{dI}{dt}+10=V_B$$

$$V_A-V_B=-10+IR+L\frac{dI}{dt}$$

= – 10 + 6 + 1 × 1 = –3V

(NEW NCERT 12th Page No. 165)

19. (1)

The plane is to be inclined at angle of repose

$\theta=\tan^{-1}(\mu)=30°$

(NEW NCERT 11th Page No. 60)

20. (2)

$$W_{mg}+W_{drag}=K_f-K_i$$

$$100\times20+W_{drag}=\frac{1}{2}\times10\times100=500$$

W_{drag} = – 1500 J

(NEW NCERT 11th Page No. 76)

21. (2)

$$C_{eq}=C_1+C_2$$

$$2C=\frac{C}{2}+\frac{kC}{2}$$

$\Rightarrow k = 3$

(NEW NCERT 12th Page No. 69)

22. (3)

Pressure at base of vessel *C* will be maximum so force on the base in vessel *C* is maximum.

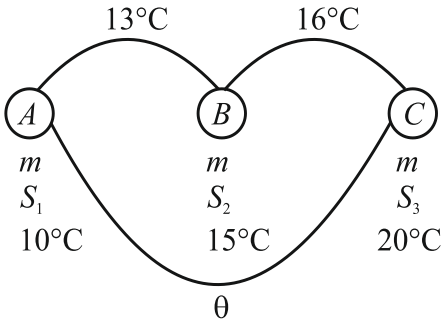
(NEW NCERT 11th Page No. 180)

23. (4)

Coefficient of mutual inductance depends on flux linkage. Flux linkage depends on all the given parameters.

(NEW NCERT 12th Page No. 168)

24. (4)



When *A* and *B* are mixed

$mS_1 \times (13 - 10) = m \times S_2 \times (15 - 13)$

$3S_1 = 2S_2$ …(1)

When B and C are mixed

$S_2 \times 1 = S_3 \times 4$ …(2)

When C and A are mixed

$S_1(\theta - 10) = S_3 \times (20 - \theta)$ …(3)

By using equation (1), (2) and (3)

We get $\theta = \frac{140}{11}$ °C

(NEW NCERT 11th Page No. 209)

25. (3)

EM waves are produced by accelerated or decelerated charges.

(NEW NCERT 11th Page No. 201)

26. (1)

$\frac{\ell}{L} \times 100 = 0.5\%$

$\Rightarrow \frac{\ell}{L} = 5 \times 10^{-3}$

So $F = YA\frac{\ell}{L} = 2 \times 10^{11} \times 10^{-6} \times 5 \times 10^{-3} = 10^3$ N

(NEW NCERT 11th Page No. 170)

27. (3)

Using mirror formula

$\frac{1}{v} + \frac{1}{u} = \frac{1}{f}$

$\frac{-1}{0.5} + \frac{1}{0.2} = \frac{1}{f}$

$-2 + 5 = \frac{1}{f}$

$f = \frac{1}{3}$ m

R = 66.67 cm

(NEW NCERT 11th Page No. 222)

28. (4)

$Q = 8 \times 7.06 - 7 \times 5.60 = 17.3$ MeV

(NEW NCERT 12th Page No. 310)

29. (2)

Using Galileo's Law, the distance in one second each for first three seconds is;

$|5$m

$|15$m

$|25$m

Total duration of fall is 3 s

$H = \frac{1}{2}gt^2 = 5 \times 9 = 45$ m

(NEW NCERT 11th Page No. 17)

30. (2)

$\frac{3\lambda D}{2d} = 0.3$

$\Rightarrow \frac{\lambda D}{d} = \frac{0.6}{3}$

Fourth bright fringe is at

$\frac{4\lambda D}{d} = \frac{4 \times 0.6}{3} = 0.8$ cm

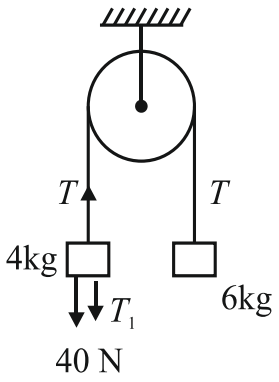
(NEW NCERT 12th Page No. 265)

31. (1)

Theoretical

(NEW NCERT 12th Page No. 239)

32. (4)



Equilibrium of 6 kg

$T = 60$ N

For equilibrium of 4 kg

$T = T_1 + 40$

$T_1 = 20$ N

(NEW NCERT 11th Page No. 58)

33. (1)

$$x = \frac{\Delta U}{\Delta Q} = \frac{C_V}{C_P} = \frac{3}{5}$$

60% goes into internal energy

$\therefore$ 40% will be used for external work.

(NEW NCERT 11th Page No. 230)

34. (1)

$$\frac{v}{4L} = 264$$

$$\frac{330}{4 \times 264} = L$$

$L = 31.25$ cm

(NEW NCERT 11th Page No. 288)

35. (2)

$$M = \mu \ell^2$$

Moment of inertia $I = \frac{M\ell^2}{6} = \frac{\mu \ell^4}{6}$

(NEW NCERT 11th Page No. 114)

SECTION-B

36. (1)

The C.O.M can have coordinates (0, 1) and (0, –1)

$$Y_{com} = \frac{M_1 Y_1 + M_2 Y_2}{M_1 + M_2}$$

$$1 = \frac{(2)(5) + 4(Y_2)}{6}$$

$$6 = 10 + 4Y_2$$

$–4 = 4Y_2$

$Y_2 = – 1$

And $Y_{COM} = – 1$

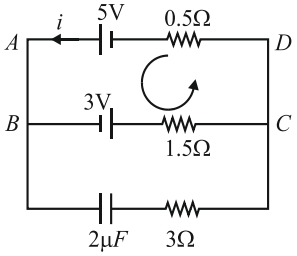
$$-1 = \frac{10 + 4Y_2}{6}$$

$$-16 = 4Y_2$$

$Y_2 = – 4$

(NEW NCERT 11th Page No. 95)

37. (3)



Applying *KVL* in loop *ABCD*

$8 – i\,(2) = 0$

$\Rightarrow i = 4$A

Potential drop across *AD* is

$$5 - i\left(\frac{1}{2}\right) = 5 - 2 = 3\text{V}$$

Charge on capacitor is

$Q = CV = 6\mu C$

(NEW NCERT 12th Page No. 98)

38. (1)

$$f \propto \sqrt{T}$$

$$\frac{\Delta f}{f} = \frac{\Delta T}{2T}$$

$$\Rightarrow \frac{\Delta T}{T} = \frac{2\Delta f}{f}$$

$$= \frac{6}{600} = 1\%$$

(NEW NCERT 11th Page No. 293)

39. (4)

$$W_{\text{cycle}} = \frac{1}{2} \times V_0 \times P_0 = \frac{P_0 V_0}{2}$$

$$W_{CA} = -P_0 V_0$$

$$\frac{W_{\text{cycle}}}{W_{CA}} = -\frac{P_0 V_0}{2P_0 V_0} = \frac{-1}{2}$$

(NEW NCERT 11th Page No. 229)

40. (1)

Both statements I and II are correct.

(NEW NCERT 11th Page No. 115)

41. (3)

Perpendicular distance of point from the wire is

$$r = \sqrt{1^2 + 2^2} = \sqrt{5}$$

$$B = \frac{\mu_0 I}{2\pi r}$$

$$= \frac{\mu_0 I}{2\pi\sqrt{5}} T$$

(NEW NCERT 12th Page No. 118)

42. (2)

Force on positive charge is towards *Q*.

Positive charges will accumulate at *Q*.

(NEW NCERT 12th Page No. 162)

43. (2)

$$V_S = \frac{1240}{400} - \frac{1240}{1127.27}$$

$$V_S = 3.1 - 1.10$$

$$= 2\,\text{V}$$

(NEW NCERT 12th Page No. 281)

44. (3)

Intensity of light after first polarizer $= \frac{I_0}{2}$

Intensity of light coming out

$$= \frac{I_0}{2}\cos^2 60° = \frac{I_0}{2} \times \frac{1}{4}$$

$$= \frac{I_0}{8}$$

(NEW NCERT 12th Page No. 269)

45. (1)

Spring constant of each part after cutting is $2K$

$$K_{eq} = 2K + 2K = 4K$$

$$T = 2\pi\sqrt{\frac{m}{4K}}$$

(NEW NCERT 11th Page No. 262)

46. (2)

Net potential $= \frac{KQ_{net}}{r}$

$$= \frac{9\times10^9 \times 5\times10^{-6}}{10\times10^{-2}}$$

$$= 45\times10^4\,\text{V}$$

(NEW NCERT 12th Page No. 48)

47. (3)

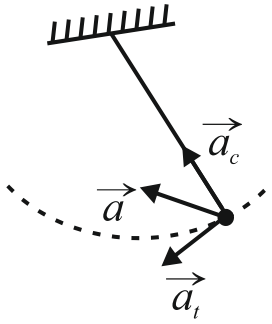
$$v = \sqrt{\frac{2gh}{1+\frac{h}{R}}} = \sqrt{\frac{2g(2R)}{1+2}}$$

$$v = \sqrt{\frac{4gR}{3}}$$

(NEW NCERT 11th Page No. 134)

48. (1)

At intermediate position the ball with have some speed and therefore will have centripetal acceleration.



$\vec{a} = \vec{a}_c + \vec{a}_t$

(NEW NCERT 11th Page No. 63)

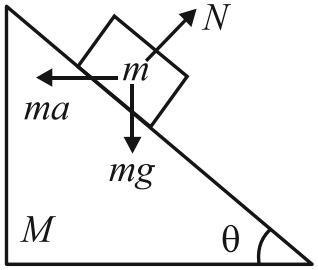
49. (1)

The acceleration should be towards right

Wrt frame of wedge block is in equilibrium.

$ma\cos\theta = mg\sin\theta$

$a = g\tan\theta$



(NEW NCERT 11th Page No. 64)

50. (4)

$$H_1 = \frac{u^2\sin^2\theta}{2g}$$

$$H_2 = \frac{u^2\cos^2\theta}{2g}$$

$$H_2 - H_1 = \frac{u^2}{2g}(\cos^2\theta - \sin^2\theta)$$

$$\Rightarrow \cos^2\theta - \sin^2\theta = \frac{200}{400} = \frac{1}{2}$$

$$\Rightarrow \cos 2\theta = \frac{1}{2}$$

$$\Rightarrow 2\theta = \frac{\pi}{3}$$

on $\theta = \frac{\pi}{6}$ or 30°

other angle is 60°

(NEW NCERT 11th Page No. 39)

(CHEMISTRY)

SECTION-A

51. (1)

(I) 2nd E.A is always endothermic

(II) Formation of NaCl(s) releases lattice energy

(III) N: $1s^2$ $2s^2$ $2p^3$

(IV) ionization process is endothermic.

(NEW NCERT 11th Part-I Page No. 89)

52. (4)

Covalent molecules are held by weak vander waal's force of attraction.

(NEW NCERT 11th Part-I Page No. 102)

53. (1)

Due to H-bonding NH_3 has more boiling point than PH_3 and AsH_3.

(OLD NCERT 12th Part-I Page No. 168)

54. (3)

(A) Xe–H_2O: Dipole – induced dipole interaction

(B) Ethanol–H_2O: Dipole–dipole interaction

(C) Liquid He: Vanderwal's force b/w the atoms

(D) Liquid HCl: Dipole–dipole interaction

(NEW NCERT 11th Part-I Page No. 107)

55. (1)

For isotonic solution,

$$\frac{w_1}{m_1V_1}=\frac{w_2}{m_2V_2}$$

$$\frac{w_1}{180\times0.5}=\frac{9.2}{180\times1}$$

W = 4.60g.

(NEW NCERT 12th Part-I Page No. 21)

56. (2)

In Reimer Tiemann reaction dichlorocarbene acts as an electrophile.

(NEW NCERT 12th Part-II Page No. 213)

57. (3)

In $KMnO_4$, Mn^{7+} is already in its highest oxidation state.

(OLD NCERT 12th Part-I Page No. 186)

58. (4)

Due to +I effect of CH_3 the e– density around B increase and hence repulsion with N increases so, bond length increases.

(NEW NCERT 11th Part-I Page No. 108)

59. (3)

$Al_4C_3 + 6H_2O \rightarrow 2Al_2O_3 + 3CH_4 \Rightarrow$ 4–H atoms.

(NEW NCERT 11th Part-I Page No. 316)

60. (3)

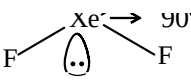
No. of atom = $\frac{5.6}{22.4}\times2N_A$

$=\frac{N_A}{2}$

(NEW NCERT 11th Part-I Page No. 18)

61. (1)

XeF_4 is sp^3d^2 hybridised



adjcent bond angle of F–Xe–F.

(NEW NCERT 11th Part-I Page No. 113)

62. (3)

$[NiX_4]^{2-}$

Ni^{2+}: $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 3d^8$

Unpaired electron need to be paired to make magnetic moment zero.

So X is SFL.

(NEW NCERT 12th Part-I Page No. 128)

63. (4)

Inert pair effect.

(OLD NCERT 11th Part-II Page No. 311)

64. (2)

$2F_2 + 2H_2O \rightarrow 4HF + O_2$

$\underset{(Cl_2 \text{ or } Br_2)}{X_2} + H_2O \rightarrow HX + HXO$

$I_2 + H_2O \rightarrow$ No reaction

(OLD NCERT 12th Part-I Page No. 195)

65. (2)

If concentration of (X) doubles rate of reaction also doubles means (r) ∝ concentration of (X).

So, order w.r.t. (x) = 1.

Hence, over all order = 3 so, w.r.t. (Y) order = 2

$r = K[X]^1[Y]^2$

(NEW NCERT 12th Part-I Page No. 66)

66. (4)

Except Bismuth, all the elements of 15th group exhibit allotropy.

(OLD NCERT 12th Part-I Page No. 175)

67. (3)

According to Faraday's first law,

$$\frac{W_{H_2}}{W_{O_2}} = \frac{Z_{H_2}}{Z_{O_2}}$$

$$\frac{W_{H_2}}{W_{O_2}} = \frac{E_{H_2}}{E_{O_2}}$$

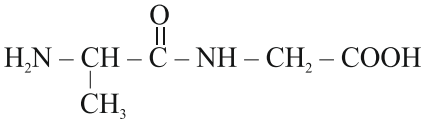
$$\frac{0.500}{W_{O_2}} = \frac{1}{8}$$

$$W_{O_2} = 4.00\,g$$

(NEW NCERT 12th Part-I Page No. 52)

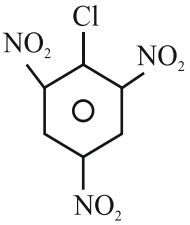
68. (2)

Protein → Peptide



(NEW NCERT 12th Part-II Page No. 292)

69. (3)

.  (Picryl chloride) requires room temperature for hydrolysis because $-NO_2$ group increase the rate of nucleophilic substitution.

. Tertiary amine does not give Hinsberg's test, because acidic hydrogen is absent.

. $2CHCl_3 + O_2 \xrightarrow{light} \underset{\text{(Phosgene) (poisonous)}}{2COCl_2} + 2HCl$

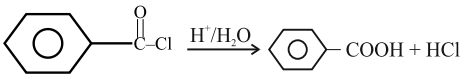
(NEW NCERT 12th Part-II Page No. 271)

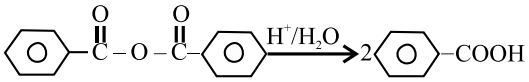
70. (2)

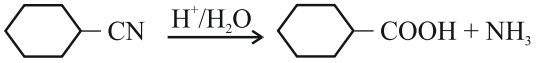
NH_2 group is not attached to α carbon atom of carboxylic acid.

(NEW NCERT 12th Part-II Page No. 290)

71. (4)

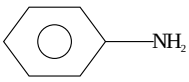
(1) 

(2) 

(3) 

(NEW NCERT 12th Part-II Page No. 247)

72. (2)

 does not give Friedel Craft Reaction because it form additive compound with $AlCl_3$.

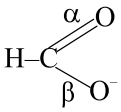
(NEW NCERT 11th Part-II Page No. 322)

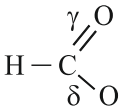
73. (3)

Inert pair effect - stability of lower O.S. increases on moving top to bottom in group 14.

(OLD NCERT 11th Part-I Page No. 316)

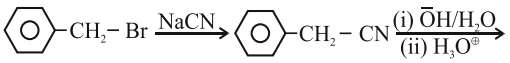
74. (1)

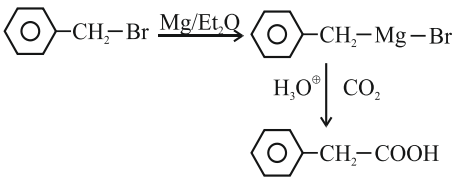
In  due to equivalent resonance α = β,

while in  , partial resonance is present so, γ < δ.

(NEW NCERT 12th Part-II Page No. 245)

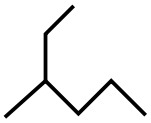
75. (3)

(1) 

(2) 

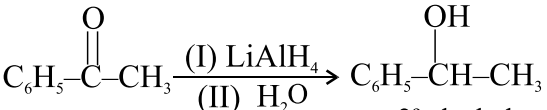
(NEW NCERT 12th Part-II Page No. 246)

76. (3)

 contain one chiral centre so optically active.

(NEW NCERT 12th Part-II Page No. 176)

77. (2)



(NEW NCERT 11th Part-II Page No. 200)

78. **(1)**

$$\frac{P_1V_1}{T_1}=\frac{P_2V_2}{T_2}$$

$$V_2=\frac{P_1V_1T_2}{P_2T_1}=\frac{700\times40\times273}{760\times300}$$

$V_2 = 33.52$ ml

$$\%N=\frac{28}{22400}\times\frac{\text{Volume of } N_2 \text{ at S.T.P}}{\text{Wt of organic compound}}\times100$$

$$=\frac{28}{22400}\times\frac{33.52}{0.25}\times100=16.76$$

(NEW NCERT 11th Part-II Page No. 288)

79. **(2)**

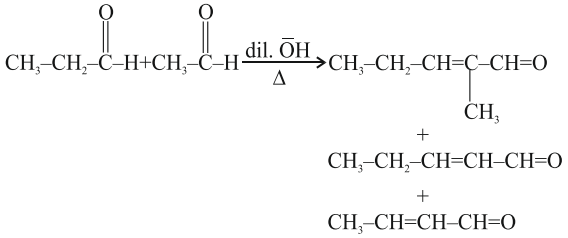
Stability order of canonical structure are;

Complete Octet (Non-Polar) > Complete Octet (Polar) > (–Ve) Charge at more E.N atom or (+Ve) Charge at less E.N atom

(NEW NCERT 11th Part-II Page No. 275)

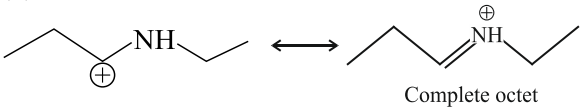
80. **(2)**

Cross aldol condensation



(NEW NCERT 12th Part-II Page No. 242)

81. **(3)**



Complete octet
Reasoning structure

(NEW NCERT 11th Part-II Page No. 275)

82. **(4)**

NaOH reacts with amphoteric oxide. As well an acidic oxide.

(OLD NCERT 11th Part-II Page No. 311)

83. **(4)**

For H-atom

$E \propto n$ (principal quantum number) (only)

Higher the value of n higher will be the energy of subshell.

(NEW NCERT 11th Part-I Page No. 61)

84. **(1)**

$$K_p = K_C\left(RT\right)^{\Delta n_g}$$

Here $\Delta n(g) = 3 - 2 = 1$

$Kp = Kc\,(RT)^1$

$Kc = Kp\,(RT)^{-1}$

$x = -1$

(NEW NCERT 11th Part-I Page No. 178)

85. **(3)**

For isothermal process, $\Delta T = 0$.

$\Delta E = nC_v\Delta T = 0$

$\Delta H = \Delta E + \Delta(PV)$

$= 0 + \Delta(nRT)$

$= nR\Delta T = 0$

(NEW NCERT 11th Part-I Page No. 143)

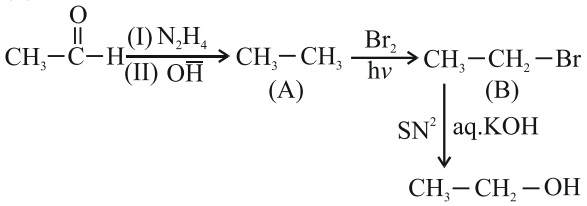
SECTION-B

86. **(1)**

Lyman series.

(NEW NCERT 11th Part-I Page No. 44)

87. **(2)**



(NEW NCERT 12th Part-II Page No. 239)

88. **(3)**

$KMnO_4$ on heating dissociates as:

$$\overset{+7}{2KMnO_4} \xrightarrow{\Delta} K_2MnO_4 + MnO_2 + O_2$$

permanganate — Manganate

Both permanganate and manganate are tetrahedral but only manganate is paramagnetic.

$\overset{+7}{Mn}: 3d^0 4s^0$ diamagnetic (no unpaired electron)

$\overset{+6}{Mn}: 3d^1 4s^0$ paramagnetic (one unpaired electron)

(NEW NCERT 12th Part-I Page No. 106)

89. **(3)**

$Ce^{4+} \xrightarrow{e^-} Ce^{3+}$ $\quad E^\circ = +1.74$ V

Positive SRP and higher SRP means greater oxidising power. So, Ce^{4+} wants to reduce to Ce^{3+} Indicates Ce^{4+} is less stable than Ce^{3+} and can oxidise water.

(NEW NCERT 12th Part-I Page No. 99)

90. **(3)**

Hypophosphorous acid H_3PO_2	+1
Orthophosphorous acid H_3PO_3	+3
Hypophosphoric acid $H_4P_2O_6$	+4
Orthophosphoric acid H_3PO_4	+5

(NEW NCERT 12th Part-I Page No. 179)

91. **(4)**

The solubility of BaF_2 is greater in an acidic solution than it is in a neutral solution because the F^- ion is a weak base. (F is the conjugate base of the weak acid HF and is therefore a weak base.)

(NEW NCERT 12th Part-I Page No. 100)

92. (1)

$$[CO_2] = Kc\ \frac{[COF_2]^2}{[CF_4]}$$

$$[CO_2] = 2.00\left(\frac{(0.25)^2}{0.11}\right) = 1.13\ M$$

(NEW NCERT 11th Part-I Page No. 179)

93. (2)

The best choice is formic acid because its pKa lies closest to the desired pH. You can calculate the ratio of conjugate base ($HCOO^-$) to acid ($HCHO_2$) required by using the Henderson-Hasselbalch equation as follows:

$$pH = pKa + \log\frac{[base]}{[acid]}$$

$$4.25 = 3.74 + \log\frac{[base]}{[acid]}$$

$$\log\frac{[base]}{[acid]} = 4.25 - 3.74$$

$$= 0.51$$

$$\frac{[base]}{[acid]} = \text{antilog}\ (0.51)$$

$$= 3.24$$

(NEW NCERT 11th Part-I Page No. 203)

94. (2)

$$\Delta S = \frac{q_{rev}}{T}$$

ΔH_{vap} = 40.7 kJmol

$\Delta H_{condensation}$ -40.7 kJ/mol

T(K) = T(°C) + 273

=100.00 + 273

= 373K

$$\Delta S = \frac{q_{rev}}{T}$$

$$= \frac{25.0\,g \times \frac{1\,mol}{18\,g} \times \left(\frac{-40.7 \times 10^3\,J}{mol}\right)}{373K}$$

$$= -151.54\ J/K$$

(NEW NCERT 11th Part-I Page No. 159)

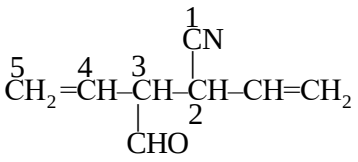
95. (4)

w = ZIt

$$= \frac{\left(\frac{197}{3}\right)}{96500} \times 5.5 \times 25 \times 60 = 5.6g$$

(NEW NCERT 12th Part-I Page No. 52)

96. (2)



∴ 2-ethenyl-3-formyl pent-4-ene nitrile.

(NEW NCERT 11th Part-I Page No. 265)

97. (3)

$$Ca(NO_3)_2(s) \longrightarrow Ca^{2+}(aq) + 2NO_3^-(aq)$$

$$X_{H_2O} = \frac{n_{H_2O}}{3 \times n_{Ca(NO_3)_2} + n_{H_2O}}$$

$$= \frac{0.927\ mol}{3(0.102)\ mol + 0.927\ mol}$$

$$= 0.7518$$

$$P_{solution} = X_{H_2O} P^0_{H_2O}$$

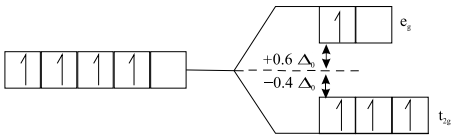
$$= 0.7518(118.1\ torr)$$

= 88.8 torr.

(NEW NCERT 12th Part-I Page No. 10)

98. (4)

Key Idea In case of high spin complex, Δ_0 is smaller than the pairing energy. That means, the energy required to pair up the fourth electron with the electrons of lower energy d-orbitals would be higher than that required to place the electrons in the higher d-orbital. Thus, pairing does not occur.



Degenerate d-orbitals

Crystal field stabilisation energy

=(-3x0.4+1x0.6) Δ_o

= (-1.2 +0.6) Δ_0

= - 0.6 Δ_o

(NEW NCERT 12th Part-I Page No. 131)

99. (1)

Equimolar mixture of D-Glucose and D-Fructose is called Invert sugar.

(NEW NCERT 12th Part-II Page No. 287)

100. (1)

Al^{3+} and Fe^{3+} sulphides hydrolyse in water. Ni^{2+} and Zn^{2+} require basic medium with H_2S to form ppt. Ca^{2+} and Ba^{2+} sulphides are soluble hence, we will receive only CuS ppt.

(NEW NCERT 11th Part-II Page No. 284)

(BOTANY)

SECTION-A

101. (2)

The study of diversity of the living organisms and the relationship between them is called systematics.

(NEW NCERT 11th Page No. 5)

102. (1)

The cyanobacteria (also referred to as blue-green algae) have chlorophyll *a* similar to green plants and are photosynthetic autotrophs.

(NEW NCERT 11th Page No. 13)

103. (2)

Fusion of two gametes dissimilar in size, as in species of *Eudorina* is termed as anisogamous. Fusion between one large, nonmotile (static) female gamete and a smaller, motile male gamete is termed oogamous, e.g., *Volvox, Fucus*.

(NEW NCERT 11th Page No. 24)

104. (3)

In majority of the dicotyledonous plants, the direct elongation of the radicle leads to the formation of primary root which grows inside the soil. It bears lateral roots of several orders that are referred to as secondary, tertiary, etc. roots. The primary roots and its branches constitute the tap root system, as seen in the mustard plant.

(NEW NCERT 11th Page No. 58)

105. (4)

In dicot stem, cortical layers below hypodermis consist of rounded thin-walled parenchymatous cells. The inner layer of the cortex is called the endodermis. The cells of the endodermis are rich in starch grains.

(NEW NCERT 11th Page No. 74, 75)

106. (3)

In 1838, Matthias Schleiden, a German botanist, examined a large number of plants and observed that all plants are composed of different kinds of cells which form the tissues of the plant. At about the same time, Theodore Schwann (1839), a British Zoologist, studied different types of animal cells and reported that cells had a thin outer layer which is today known as the 'plasma membrane'. He also concluded, based on his studies on plant tissues, that the presence of cell wall is a unique character of the plant cells. On the basis of this, Schwann proposed the hypothesis that the bodies of animals and plants are composed of cells and products of cells.

(NEW NCERT 11th Page No. 87, 88)

107. (3)

The cells that do not divide further exit G_1 phase to enter an inactive stage. The plants can show mitotic divisions in both haploid and diploid cells.

(NEW NCERT 11th Page No. 122)

108. (4)

Cyclic photophosphorylation	Only PS I is involved
Non-cyclic photophosphorylation	PS I and PS II are involved
C_4 cycle	First CO_2 fixation by PEPcase
C_3 cycle	First CO_2 fixation by RuBisCO

(NEW NCERT 11th Page No. 140, 143, 146)

109. (3)

The compounds that are oxidised during the process of respiration are known as respiratory substrates.

(NEW NCERT 11th Page No. 154)

110. (4)

Auxins	Promote apical dominance
Gibberellins	Promote bolting in beet
Cytokinins	Promote adventitious shoot formation
Ethylene	Hastens fruit ripening in tomatoes

(NEW NCERT 11th Page No. 175, 176, 177)

111. (2)

A typical angiosperm anther is bilobed with each lobe having two theca, i.e., they are dithecous. Therefore, an anther has in total four theca.

(NEW NCERT 12th Page No. 9)

112. (2)

Mendel self-pollinated the F_2 pea plants and found that dwarf F_2 plants continued to generate dwarf plants in F_3 and F_4 generations. It is not possible to know the genotypic composition by simply looking at the phenotype of a dominant trait. That is, for example, whether a tall plant from F_1 or F_2 has TT or Tt composition, cannot be predicted. Therefore, to determine the genotype of a tall plant at F_2, Mendel crossed the tall plant from F_2 with a dwarf plant. This he called a test cross.

(NEW NCERT 12th Page No. 58)

113. (2)

The mRNA provides the template, tRNA brings amino acids and reads the genetic code, and rRNAs play structural and catalytic role during translation.

(NEW NCERT 12th Page No. 93)

114. (3)

Fungi are also known to form symbiotic associations with plants (mycorrhiza). Many members of the genus *Glomus* form mycorrhiza.

(NEW NCERT 12th Page No. 158)

115. (2)

Net primary productivity is the available biomass for the consumption to heterotrophs (herbiviores and decomposers).

(NEW NCERT 12th Page No. 207)

116. (2)

Of the incident solar radiation less than 50 per cent of it is photosynthetically active radiation (PAR). We know that plants and photosynthetic bacteria (autotrophs), fix Sun's radiant energy to make food from simple inorganic materials. Plants capture only 2-10 per cent of the PAR and this small amount of energy sustains the entire living world.

(NEW NCERT 12th Page No. 209)

117. (1)

According to the 'rivet popper hypothesis' used by Stanford ecologist Paul Ehrlich, in an airplane (ecosystem) all parts are joined together using thousands of rivets (species). If every passenger travelling in it starts popping a rivet to take home (causing a species to become extinct), it may not affect flight safety (proper functioning of the ecosystem) initially, but as more and more rivets are removed, the plane becomes dangerously weak over a period of time. Furthermore, which rivet is removed may also be critical. Loss of rivets on the wings (key species that drive major ecosystem functions) is obviously a more serious threat to flight safety than loss of a few rivets on the seats or windows inside the plane.

(NEW NCERT 12th Page No. 221)

118. (3)

In dorsiventral leaf mesophyll cells are differentiated into palisade and spongy parenchyma. The abaxial epidermis generally bears more stomata than the adaxial epidermis. The vascular bundles are surrounded by a layer of thick-walled bundle sheath cells. The epidermis which covers both the upper surface (adaxial epidermis) and lower surface (abaxial epidermis) of the leaf has a conspicuous cuticle.

(NEW NCERT 11th Page No. 76, 77)

119. (3)

Chloroplast, chromoplast and cell wall are the structures that are present only in the plant cell compared to animal cell.

(NEW NCERT 11th Page No. 104)

120. (3)

Meiosis involves pairing of homologous chromosomes and recombination between non-sister chromatids of homologous chromosomes.

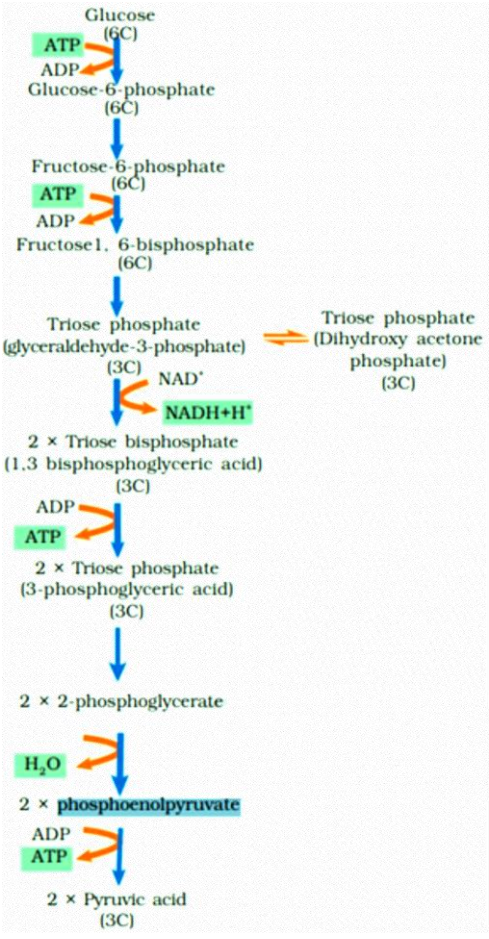
(NEW NCERT 11th Page No. 125)

121. (2)

During photorespiration, the reaction between RuBP and O_2 takes place leading to the formation of PGA and phosphoglycolate moelcules.

(NEW NCERT 11th Page No. 147)

122. (4)



(NEW NCERT 11th Page No. 156)

123. (2)

In arithmetic growth, following mitotic cell division, only one daughter cell continues to divide while the other differentiates and matures.

(NEW NCERT 11th Page No. 170)

124. (1)

Exine	Possess germ pore
Intine	Made of cellulose and pectin
Vegetative cell	Contains abundant food reserve material
Generative cell	Divides to form the male gametes

(NEW NCERT 12th Page No. 07)

125. (4)

The law of segregation is based on the fact that the alleles do not show any blending and that both the characters are recovered as such in the F_2 generation though one of these is not seen at the F_1 stage. Though the parents contain two alleles during gamete formation, the factors or alleles of a pair segregate from each other such that a gamete receives only one of the two factors. Of course, a homozygous parent produces all gametes that are similar while a heterozygous one produces two kinds of gametes each having one allele with equal proportion.

(NEW NCERT 12th Page No. 59)

126. (1)

RNA was the first genetic material. There is now enough evidence to suggest that essential life processes (such as metabolism, translation, splicing, etc.), evolved around RNA. RNA used to act as a genetic material as well as a catalyst (there are some important biochemical reactions in living systems that are catalysed by RNA catalysts and not by protein enzymes). But, RNA being a catalyst was reactive and hence unstable. Therefore, DNA has evolved from RNA with chemical modifications that make it more stable.

(NEW NCERT 12th Page No. 88)

127. (4)

Birth rate is increase in population by birth w.r.t the initial population per unit time. Therefore, birth rate can be calculated as,

Birth rate = 4/10 = 0.4 offspring per rabbit per year

(NEW NCERT 12th Page No. 191)

128. (4)

RER is frequently observed in the cells actively involved in protein synthesis and secretion. In animal cells lipid-like steroidal hormones are synthesised in SER.

(NEW NCERT 11th Page No. 95)

129. (1)

When several factors affect any [bio] chemical process, Blackman's (1905) Law of Limiting Factors comes into effect. This states the following: If a chemical process is affected by more than one factor, then its rate will be determined by the factor which is nearest to its minimal value: it is the factor which directly affects the process if its quantity is changed.

(NEW NCERT 11th Page No. 149)

130. (2)

In yeast, the incomplete oxidation of glucose is achieved under anaerobic conditions. Anaerobic bacteria produce lactic acid from pyruvic acid through respiration.

(NEW NCERT 11th Page No. 157)

131. (4)

The majority of flowering plants show monosporic development of embryo sac. A megaspore mother cell undergoes meiosis to form four megaspores.

(NEW NCERT 12th Page No. 10)

132. (2)

The inheritance of flower colour in the dog flower (snapdragon or *Antirrhinum sp*.) is a good example to understand incomplete dominance.

(NEW NCERT 12th Page No. 60)

133. (3)

A transcription unit in DNA is defined primarily by the three regions in the DNA:

(i) A Promoter

(ii) The Structural gene

(iii) A Terminator

(NEW NCERT 12th Page No. 91)

134. (1)

Allele from Parent 1	Allele from Parent 2	Genotype of offspring	Blood types of offspring
I^A	I^A	$I^A I^A$	A
I^A	I^B	$I^A I^B$	AB
I^A	i	$I^A i$	A
I^B	I^A	$I^A I^B$	AB
I^B	I^B	$I^B I^B$	B
I^B	i	$I^B i$	B
i	i	$i\,i$	O

(NEW NCERT 12th Page No. 61)

135. (2)

The sequence of the mRNA and coding strand of DNA are similar except that T of DNA is replaced by U. Also, the direction of the coding strand and mRNA sequence is same. Hence, the sequence of mRNA is 5'-AUGCCGAU-3'.

(NEW NCERT 12th Page No. 92)

SECTION-B

136. (1)

The sex organs in bryophytes are multicellular. The male sex organ is called antheridium. They produce biflagellate antherozoids.

(NEW NCERT 11th Page No. 29)

137. (2)

The lamina or the leaf blade is the green expanded part of the leaf with veins and veinlets.

(NEW NCERT 11th Page No. 60)

138. (1)

All tissues on the inner side of the endodermis in dicot stem such as pericycle, vascular bundles and pith constitute the stele.

(NEW NCERT 11th Page No. 74)

139. (4)

The detailed structure of the membrane was studied only after the advent of the electron microscope in the 1950s. Meanwhile, chemical studies on the cell membrane, especially in human red blood cells (RBCs), enabled the scientists to deduce the possible structure of plasma membrane.

(NEW NCERT 11th Page No. 93)

140. (1)

Interkinesis	Followed by prophase II
Metaphase II	Microtubules get attached to the kinetochores of sister chromatids
Metaphase I	Microtubules get attached to the kinetochores of homologous chromosomes
Prophase I	Recombination takes place

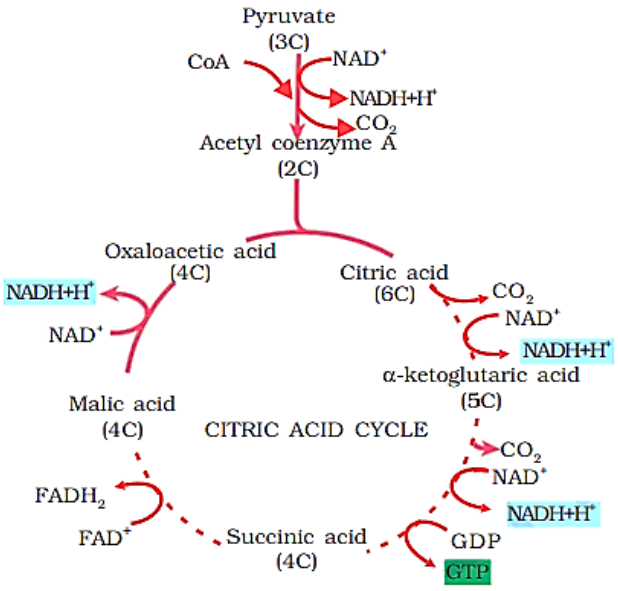
(NEW NCERT 11th Page No. 126, 127, 128)

141. (3)

ATP synthase has a channel that allows diffusion of protons from thylakoid lumen to stroma of chloroplast.

(NEW NCERT 11th Page No. 141, 142)

142. (3)



(NEW NCERT 11th Page No. 159)

143. (3)

Ethylene accelerates abscission in flowers and fruits like thinning of cotton, cherry, walnut.

(NEW NCERT 11th Page No. 177)

144. (2)

Flowers with the exposed anther and stigma are known as chasmogamous.

(NEW NCERT 12th Page No. 12)

145. (2)

It is observed that in a large number of insects the mechanism of sex determination is of the XO type, i.e., all eggs bear an additional X-chromosome besides the other chromosomes (autosomes).

(NEW NCERT 12th Page No. 70)

146. (3)

Gene *i*	Codes for repressor protein
Gene *y*	Codes for permease
Gene *z*	Codes for beta-galactosidase
Gene *a*	Codes for transacetylase

(NEW NCERT 12th Page No. 101)

147. (3)

Treatment of waste water is done by the heterotrophic microbes naturally present in the sewage.

(NEW NCERT 12th Page No. 153, 154)

148. (4)

Species A	Species B	Name of Interaction
+	+	*Mutualism*
–	–	*Competition*
+	–	*Predation*
+	–	*Parasitism*
+	0	*Commensalism*
–	0	*Amensalism*

(NEW NCERT 12th Page No. 197)

149. (3)

Pyramid of energy is always upright, can never be inverted, because when energy flows from a particular trophic level to the next trophic level, some energy is always lost as heat at each step.

(NEW NCERT 12th Page No. 211)

150. (1)

More than 70 per cent of all the species recorded are animals, while plants (including algae, fungi, bryophytes, gymnosperms and angiosperms) comprise no more than 22 per cent of the total. Among animals, insects are the most species-rich taxonomic group, making up more than 70 per cent of the total. That means, out of every 10 animals on this planet, 7 are insects.

(NEW NCERT 12th Page No. 218)

(ZOOLOGY)

SECTION-A

151. (2)

The lactational amenorrhea (absence of menstruation) method is based on the fact that ovulation and therefore the cycle does not occur during the period of intense lactation following parturition. Therefore, as long as the mother breastfeeds the child fully, the chances of conception are almost nil. However, this method has been reported to be effective only up to a maximum period of six months following parturition. As no medicines or devices are used in these methods, side effects are almost nil. Chances of failure, though, of this method are also high.

(NEW NCERT 12th Page No. 44)

152. (3)

O_2 can bind with haemoglobin in a reversible manner to form oxyhaemoglobin. Each haemoglobin molecule can carry a maximum of four molecules of O_2. Binding of oxygen with haemoglobin is primarily related to partial pressure of O_2. Partial pressure of CO_2, hydrogen ion concentration and temperature are the other factors which can interfere with this binding.

(NEW NCERT 11th Page No. 189)

153. (2)

The regions outside the seminiferous tubules called interstitial spaces, contain small blood vessels and interstitial cells or Leydig cells. Immunologically competent cells are also present.

(NEW NCERT 12th Page No. 27)

154. (4)

Annelids are commonly segmented worms. *Nereis* is marine and *Hirudinaria* is a freshwater annelid. Earthworms and leeches are monoecious and *Nereis* is dioecious..

(NEW NCERT 11th Page No. 43)

155. (1)

The recombinant plasmids will lose tetracycline resistance due to the insertion of foreign DNA at the BamHI but can still be selected out from non-recombinant ones by plating the transformants on tetracycline-containing medium. The transformants growing on an ampicillin-containing medium are then transferred to a medium containing tetracycline. The recombinants will grow in an ampicillin-containing medium but not on that containing tetracycline. However, non-recombinants will grow on the medium containing both antibiotics.

(NEW NCERT 12th Page No. 169, 170)

156. (3)

Origin of replication (ori) is a sequence from where replication starts and any piece of DNA when linked to this sequence can be made to replicate within the host cells. This sequence is also responsible for controlling the copy number of the linked DNA. So, if one wants to recover many copies of the target DNA it should be cloned in a vector whose origin support high copy number.

(NEW NCERT 12th Page No. 169)

157. (3)

Normal activities of the heart are regulated intrinsically, i.e., auto-regulated by specialized muscles (nodal tissue), hence the heart is called myogenic.

(NEW NCERT 11th Page No. 202)

158. (4)

Interferons are an example of a cytokine barrier. Virus-infected cells secrete proteins called interferons which protect non-infected cells from further viral infection. Polymorpho-nuclear leukocytes (PMNL-neutrophils) and monocytes and natural killers are various types of lymphocytes present in the blood and are examples of cellular barriers.

(NEW NCERT 12th Page No. 134, 135)

159. (2)

In proteins, only right-handed helices are observed. Only some portions of protein thread are arranged in the form of a helix while other regions are folded into other forms to form a secondary structure.

(NEW NCERT 11th Page. No. 112)

160. (2)

When an impulse (action potential) arrives at the axon terminal, it stimulates the movement of the synaptic vesicles towards the membrane where they fuse with the plasma membrane and release their neurotransmitters in the synaptic cleft.

(NEW NCERT 11th Page No. 234, 235)

161. (3)

In the case of industrial melanism, birds are the predators of moths so they are the agent of natural selection.

(NEW NCERT, 12th Page No. 116)

162. (4)

Rheumatoid arthritis is an auto-immune disorder in which the body has lost the ability to discriminate between self and non-self cells and attacks self cells. It mostly affects joints of our body.

(NEW NCERT 12th Page No. 137)

163. (2)

List-I	List-II
Sertoli cells	Nutrition to the germ cells
Leydig cells	Testicular hormones
Epididymis	Male sex accessory duct
Urethral meatus	External opening of urethra

(NEW NCERT 12th Page No. 27)

164. (1)

Glucocorticoids, particularly cortisol, produce anti-inflammatory reactions and suppress the immune response. It retards the phagocytic activities of WBCs and thus suppresses inflammation reactions.

(NEW NCERT 11th Page No. 245)

165. (4)

The tumor inducing (Ti) plasmid of *Agrobacterium tumifaciens* has now been modified into a cloning vector which is no more pathogenic to the plants but is still able to use the mechanisms to deliver genes of our interest into a variety of plants.

(NEW NCERT 12th Page No. 170)

166. (1)

Epinephrine is secreted by adrenal medulla in response to stress or any kind of emergency situation. It increase the heart beat, the strength of heart contraction and the rate of respiration.

(NEW NCERT 11th Page No. 244, 245)

167. (2)

List-I (Blood group)	List-II (Antibody in plasma)
A	anti-B
AB	Nil
O	anti-A, B
B	anti-A

(NEW NCERT 11th Page No. 195)

168. (1)

Tertiary follicle is characterised by a fluid filled cavity called antrum. The theca layer is organised into an inner theca interna and an outer theca externa. It is at this stage that the primary oocyte within the tertiary follicle grows in size and completes its first meiotic division and form first polar body.

(NEW NCERT 12th Page No. 32)

169. (1)

Though the heart is auto excitable, its functions can be moderated by neural and hormonal mechanisms. Lymph is almost similar to blood except for the protein content and the formed elements.

(NEW NCERT 11th Page No. 203, 204)

170. (3)

When necessary, doctors commonly use oxytocin injections to induce delivery. Oxytocin mimics the natural hormone produced by the body and helps stimulate uterine contractions, thereby initiating the process of childbirth.

(NEW NCERT 12th Page No. 54)

171. (4)

Towards the centre of the inner concave surface of the kidney is a notch called the hilum through which the ureter, blood vessels, and nerves enter. Inner to the hilum is a broad funnel-shaped space called the renal pelvis with projections called calyces.

(NEW NCERT 11th Page No. 206)

172. (3)

Today transgenic models exist for many human diseases such as cancer, cystic fibrosis, rheumatoid arthritis and Alzheimer's. Transgenic animals are used for studying vaccine safety as well as preparation of biological products. Transgenic animals are not typically used for enhancing crop yield and resistance in agriculture. Instead, this application is primarily associated with genetically modified crops, where specific genes are inserted into plants to confer desirable traits such as pest resistance, herbicide tolerance, and increased yield.

(NEW NCERT 12th Page No. 183, 184)

173. (4)

Fibrinogen, globulins and albumins are the major proteins present in the plasma. Fibrinogens are needed for clotting or coagulation of blood. Globulins primarily are involved in the defense mechanisms of the body and the albumins help in maintaining the osmotic balance.

(NEW NCERT 11th Page No. 202)

174. (2)

Osteichthyes include both marine and freshwater fishes with bony endoskeleton. Their body is streamlined. The mouth is mostly terminal.

(NEW NCERT 11th Page No. 48)

175. (3)

Aldosterone is a mineralocorticoid released by the adrenal cortex. It is responsible for maintaining electrolyte balance, osmotic pressure, and blood pressure. It has no role in sugar metabolism. The endocrine part of the pancreas secretes insulin and glucagon which play an important role in sugar metabolism. Cortisol is a glucocorticoid secreted by the adrenal cortex is also involved in glucose metabolism i.e. gluconeogenesis.

(NEW NCERT 11th Page No. 242)

176. (3)

Entamoeba histolytica is a protozoan parasite in the large intestine of human which causes amoebiasis (amoebic dysentery). Symptoms of this disease include constipation, abdominal pain and cramps, stools with excess mucous and blood clots.

(NEW NCERT 12th Page No. 132, 133)

177. (2)

A pair of oviducts arising from the ovaries opens into the cloaca separately. Bidder's canal is present in male reproductive system of frog.

(NEW NCERT 11th Page No. 84)

178. (1)

Based on the number of axon and dendrites, the neurons are divided into three types, i.e., multipolar (with one axon and two or more dendrites; found in the cerebral cortex), bipolar (with one axon and one dendrite, found in the retina of eye) and unipolar (cell body with one axon only; found usually in the embryonic stage).

(NEW NCERT 11th Page No. 232)

179. (4)

A fall in glomerular blood flow/glomerular blood pressure/GFR can activate the JG cells to release renin which converts angiotensinogen in blood to angiotensin I and further to angiotensin II.

(NEW NCERT 11th Page No. 212)

180. (2)

GEAC stands for Genetic Engineering Approval Committee. Transgenic mice are being used to test the safety of the polio vaccine. In ADA deficiency genetically modified WBCs are infused. α-1-antitrypsin is used to treat emphysema.

(NEW NCERT 12th, Page No. 182, 184)

181. (2)

Transformation is the process by which foreign DNA is introduced into the cells of an organism, leading to the creation of transgenic organisms.

(NEW NCERT 12th Page No. 169)

182. (1)

Each terminal bronchiole gives rise to a number of very thin, irregular walled and vascularised bag like structures called alveoli. It is made up of squamous epithelium which is single layered.

(NEW NCERT 11th Page No. 184)

183. (1)

During pregnancy the levels of other hormones like estrogens, progestogens, cortisol, prolactin, thyroxine, etc., are increased several folds in the maternal blood. Increased production of these hormones is essential for supporting the fetal growth, metabolic changes in the mother and maintenance of pregnancy.

(NEW NCERT 12th Page No. 37)

184. (3)

The cardiac output of an athlete will be much higher than that of an ordinary man. Athletes often have a higher cardiac output due to their well-trained cardiovascular system. Regular exercise increases the heart's efficiency, allowing it to pump more blood with each beat. Therefore, athletes require fewer beats per minute to maintain adequate circulation. For example, a well-trained athlete might have a normal resting heart rate closer to 40 beats per minute as compared to normal individual in which heart bets 72 times per minute.

(NEW NCERT 11th Page No. 200)

185. (1)

In cartilaginous joints, the bones involved are joined together with the help of cartilages. The joint between the adjacent vertebrae in the vertebral column is of this pattern and it permits limited movements.

(NEW NCERT 11th Page No. 227)

SECTION- B

186. (4)

Spermicidal creams, jellies and foams are usually used along with barriers to increase their contraceptive efficiency. IUDs are ideal contraceptive for the females who want to delay pregnancy or space children. Oral administration of small doses of either progestogens or progestogen–estrogen combinations is contraceptive method used by the females. They are used in the form of tablets. They inhibit ovulation and implantation as well as alter the quality of cervical mucus to prevent/retard entry of sperms.

(NEW NCERT 12th Page No. 41, 44, 45)

187. (2)

Metagenesis is observed in Cnidarians which exist in both forms and exhibit alternation of generation i.e., polyps produce medusae asexually and medusae form the polyps sexually (e.g., *Obelia*). In Ctenophore, the body bears eight external rows of ciliated comb plates which help in locomotion.

(NEW NCERT 11th Page No. 41, 42)

188. (4)

The spermatogonia present on the inside wall of seminiferous tubules multiply by mitotic division and increase in numbers. Some of the spermatogonia called primary spermatocytes periodically undergo meiosis. A primary spermatocyte completes the first meiotic division (reduction division) leading to formation of two equal, haploid cells called secondary spermatocytes, which have only 23 chromosomes each.

(NEW NCERT 12th Page No. 31)

189. (3)

In females, the 7th sternum is boat shaped and together with the 8th and 9th sterna forms a brood or genital pouch whose anterior part contains female gonopore, spermathecal pores and collateral glands. Phallic gland is present in male cockroach. In males, genital pouch or chamber lies at the hind end of abdomen bounded dorsally by 9th and 10th terga and ventrally by the 9th sternum. It contains dorsal anus, ventral male genital pore and gonapophysis.

(Old NCERT 12th Page No. 112)

190. (4)

In autoradiography the clone having the mutated gene will not appear on the photographic film, because the probe will not have complementarity with the mutated gene.

(NEW NCERT 12th Page No. 183)

191. (4)

The frequency of recessive allele for certain hereditary trait (Let q) = 0.40

The frequency of dominant allele = p

According to H.W equilibrium, p + q = 1

P = 1 – q

= 1 – 0.40

= 0.60

The frequency of homozygous dominant genotype in total population: $p^2 = (0.6)^2 = 0.36$ or 36%.

The frequency of heterozygous dominant genotype in total population: 2pq = 2 ×0.6 × 0.4 = 0.48

= 48%

Hence, the percentage of dominant individuals in generation = (36 + 48)%

= 84%

(NEW NCERT 12th Page No. 121)

192. (3)

Partial Pressures (in mm Hg) of Oxygen and Carbon dioxide at Different Parts Involved in Diffusion in Comparison to those in Atmosphere are:

Respiratory Gas	Atmospheric Air	Alveoli	Blood (Deoxygenated)	Blood (Oxygenated)	Tissues
O_2	159	104	40	95	40
CO_2	0.3	40	45	40	45

(NEW NCERT 11th Page No. 199)

193. (3)

A person who has received a cut and is bleeding needs to be given anti-tetanus treatment. Anti-tetanus injection enables immunity by providing antitoxin i.e. antibodies to the toxin for tetanus.

(NEW NCERT 12th Page No. 136)

194. (4)

Pineal secretes a hormone called melatonin. Melatonin plays a very important role in the regulation of a 24-hour (diurnal) rhythm of our body. For example, it helps in maintaining the normal rhythms of sleep-wake cycle, body temperature. In addition, melatonin also influences metabolism, pigmentation, the menstrual cycle as well as our defense capability.

(NEW NCERT 11th Page No. 242)

195. (3)

Lemur is a placental mammal and spotted cuscus is an Australian marsupial. Both are example of convergent evolution. Pouched mammals of Australia survived because of lack of competition from any other mammals.

(NEW NCERT 12th Page No. 118, 122, 123, 125)

196. (1)

Fibres of the tracts are covered with the myelin sheath, which constitute the inner part of cerebral hemisphere. They give an opaque white appearance to the layer and, hence, is called the white matter.

(NEW NCERT 11th Page No. 236)

197. (4)

Polysaccharides are long chains of sugars. They are threads containing different monosaccharides as building blocks. For example, Glycogen, chitin, cellulose and starch.

(NEW NCERT 11th Page No. 110)

198. (3)

Myoglobin content is high in some of the muscles which gives a reddish appearance. Such muscles are called the Red fibres. These muscles also contain plenty of mitochondria which can utilise the large amount of oxygen stored in them for ATP production. These muscles, therefore, can also be called aerobic muscles. On the other hand, some of the muscles possess very less quantity of myoglobin and therefore, appear pale or whitish. These are the White fibres. Number of mitochondria are also few in them, but the amount of sarcoplasmic reticulum is high.

(NEW NCERT 11th Page No. 223)

199. (4)

Presence of glucose and ketone bodies in urine are indicative of diabetes mellitus, whereas diabetes insipidus is caused due to deficiency of antidiuretic hormone or ADH which regulates the body's water balance.

(NEW NCERT 11th Page No. 213)

200. (2)

If a recombinant DNA is inserted within the coding sequence of an enzyme, β-galactosidase then it results into inactivation of the gene for synthesis of this enzyme, which is referred to as insertional inactivation. The presence of a chromogenic substrate gives blue coloured colonies if the plasmid in the bacteria does not have an insert. Presence of insert results into insertional inactivation of the β-galactosidase gene and the colonies do not produce any colour, these are identified as recombinant colonies.

(NEW NCERT 12th Page No. 170)

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